Discussion on Prospects in elongation of railway transition curves

Kaewunruen, Sakdirat

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DISCUSSION ON

“Prospects in elongation of railway transition curves by Piotr Chrostowski, Wladyslaw Koc, Katarzyna Palikowska”

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by

Sakdirat Kaewunruen,
Birmingham Centre for Railway Research and Education
The University of Birmingham B152TT UK

The paper under discussion presents an elongation of existing transition curves during track renewal to improve allowable train speed and ride comfort. Horizontal arcs or alignments have been re-designed to enable longer and smoother track cant transition (or superelevation transition). This will effectively reduce track twist during the transition. However, it should be further noted that the consideration should also embrace system thinking approach whether it is a semi-green or brown field project. Lifecycle evaluation should be a key concern for track designers whether the transition elongation is suitable (Kaewunruen et al., 2015). Mostly, transition curves adopt cubic parabola formulation to estimate co-ordinates along the joining transition arc length between the transition point and a curve arc. In practice, it is very difficult to align rail cant to perfectly match the transition requirements. This aspect is crucial for life cycle management or maintenance of railway tracks. Very frequently, rail surface defects are found along the transition arc length as shown in Figure 1 (Wilson et al., 2012; Kaewunruen and Ishida, 2015). The rail replacement in this section thus becomes very costly as the whole length or majority of rail length must be rerailed for dimensional and functional compatibility. On this ground, unless wheel/rail condition is properly managed, the elongation of such transition arc length could potentially lead to higher costs and time of either planed or unplanned track maintenance.

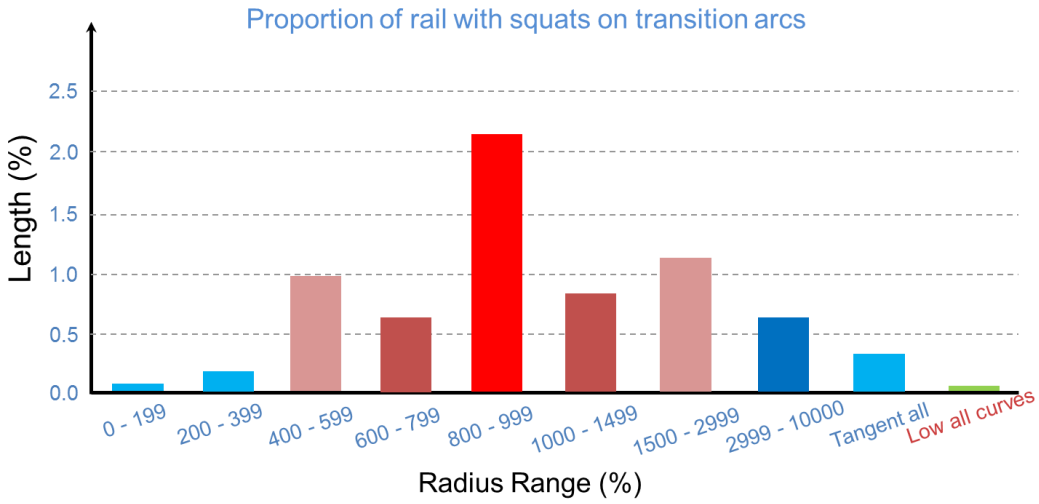

Figure 1 Distribution of rail surface defects on transition curves (adopted from Wilson et al., 2012)

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